

## **WHAT IS CLAIMED IS:**

1. A retrograde cannula for delivering fluid to a patient's vessel, the cannula comprising:

a body arrangement defining a longitudinal axis and including coaxial inner and outer bodies, at least a portion of the inner body being axially slidable within the outer body, the inner body forming an infusion lumen extending between proximal and distal ends of the inner body for conducting fluid, the infusion lumen including at least one outlet adjacent the distal end of the inner body thereof for discharging the fluid; and

449 a sealing member disposed on the body arrangement adjacent a distal end of the outer body and being expandible into sealing relationship with the vessel, the sealing member including proximal and distal ends that are moved away from another to collapse the sealing member in response to axial sliding of the inner body within the outer body to reduce a profile of the cannula.

2. The cannula according to claim 1 wherein the proximal end of the sealing member is connected to the outer body, the distal end of the sealing member arranged to be displaced forwardly by the inner body in response to axial sliding of the inner body within the outer body.

fig 6/7 3. The cannula according to claim 2 wherein the distal end of the sealing member is affixed to the inner body.

4. The cannula according to claim 3 wherein the sealing member comprises an inflatable balloon, the inner body including communication passages for communicating the infusion lumen with the interior of the balloon.

5 5. The cannula according to claim 2 wherein the outer body includes a bulbous portion defined by convexly projecting ribs spaced circumferentially apart; the sealing member arranged to surround the bulbous portion; the proximal and distal ends of the sealing member affixed to the outer body with the enlargement disposed between the proximal and distal ends of the sealing member; a distal portion of the inner body affixed to a distal portion of the outer body at a location distally of the bulbous portion; the ribs being collapsible to a smaller profile in response to axial sliding of the inner body and simultaneous axial displacement of the distal portion of the outer body.

OK  
Affix  
= To place  
Attract At the  
seal 10

15 6. The cannula according to claim 5 wherein the sealing member comprises an inflatable balloon, the infusion lumen communicating with an interior of the balloon through spaces formed between adjacent ribs.

BALLOON  
= sleeve  
P/N/R = Balloon sleeve

20 7. The cannula according to claim 2 wherein the sealing member is elastic and normally assumes an expanded state; an interior of the sealing member communicating with the infusion lumen for receiving fluid therefrom; the sealing member including holes for discharging fluid received from the infusion lumen; the inner body being engageable with the distal end of the sealing member in response to axial sliding of the inner body within the outer body to collapse the sealing member to a smaller profile.

8. The cannula according to claim 1 further including holding means for holding the inner and outer bodies in selected longitudinal relationship.

9. The cannula according to claim 8 wherein the holding means  
5 comprises a pin-and-slot connection between the inner and outer bodies,  
the slot including notches for receiving the pin.

10. A method of inserting a retrograde cannula into a vessel of a patient's body, the cannula comprising a body arrangement including coaxial inner and outer bodies, the inner body being axially slidably within the outer body, the inner body forming an infusion lumen extending between proximal and distal ends of the inner body for conducting pressurized fluid, the inner body including an outlet adjacent the distal end thereof for discharging the fluid, and a sealing member disposed on the body arrangement adjacent a distal end of the outer body and being expandible into sealing relationship with the vessel, the sealing member having proximal and distal ends that are moved away from one another to collapse the sealing member in response to axial sliding of the inner body within the outer body to reduce a profile of the cannula, the method comprising the steps of:

20 A) axially sliding the inner body within the outer body in a first direction to move the proximal and distal ends of the sealing member away from one another for collapsing the sealing member to a smaller profile;

- B) inserting the reduced-profile cannula into the vessel; and
- C) axially sliding the inner body within the outer body in a second direction to move the proximal and distal ends of the sealing member toward one another for permitting the sealing member to expand outwardly.

11. The method according to claim 10 wherein the proximal end of the sealing member is affixed to the outer body, the distal portion of the sealing member being affixed to the inner body, wherein axially forward sliding of the inner body moves the distal end of the balloon forwardly relative to the proximal end thereof.

12. The method according to claim 11 wherein the sealing member comprises an inflatable balloon, and further comprising the step of conducting fluid through the infusion lumen for inflating the balloon subsequent to step C.

13. The method according to claim 10 wherein the outer body includes a collapsible bulbous portion disposed axially between the proximal and distal ends of the sealing member; the inner and outer bodies being affixed together at a location distally of the bulbous portion; wherein step A comprises displacing distal portions of the inner and outer bodies together relative to a proximal portion of the outer body for collapsing the bulbous portion.

14. The method according to claim 10 wherein the proximal end of the sealing member is affixed to the outer body, step A comprising moving the inner body into contact with a distal end of the sealing member to collapse the sealing member.

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